MULTI-SENSORY EXPERIENCE DESIGN AND ITS IMPACT ON ONLINE PURCHASE BEHAVIOR

Synopsis

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SECTION 1

Introduction

1.1 Experience Design as a Science

In the service driven economy, businesses today are striving to command a premium by offering experiences and not merely by selling a product or service (Pine and Gilmore, 1998). When consumers buy a product or a service, they are essentially buying an experience, hence it is important to understand how to design a holistic experience for the consumer that resonates with them and can influence their loyalty and purchase decisions (Schmitt, 2010). The experiential view focuses on the hedonic and aesthetic nature of consumption and regards the consumption experience as a pursuit of fantasy and fun (Holbrook and Hirschman, 1982). This philosophy has been adopted by many traditional and digital companies like Walt Disney, Lego, Tesla, Facebook to name a few. The common theme across all these companies, is the offering of a positive emotional customer experience. They have intentionally used services and products to engage customers in a way that provides a holistic experience covering emotion, cognition, and aesthetics. A complete experience involves responses elicited by the interaction between a user and a product, including aesthetic gratification, the meanings we attach to the product, and the emotions that are elicited (Hekkert, 2006).

Design as a science or a way of thinking was first proposed by Nobel Laureate Herbert A. Simon in his book, Sciences of the Artificial (1969) where he discusses that to design a product, or a service is to devise a course of action aimed at changing existing situations into preferred ones (Simon, 1969). The idea of design as a science also appeared in McKim's Experiences in Visual Thinking (1973).

Design further gained popularity and worldwide acclaim as a profession that can directly impact business metrics. Two key contributors to this space have been Apple founder Steve Jobs and the founder of IDEO David Kelley, who are credited with creating innovative products that enhance customer experience. The focus of marketers also shifted towards designing experiences, as against traditional features and benefits marketing and brand communications (Schmitt, 1999). Design driven companies like Apple, Ford, Coca-cola, Walt Disney, Tesla, Amazon, Netflix and many others lay emphasis on the experience their products offer to their consumers.

Marketers often overlook the fact that products and services need to offer a holistic experience to the user. There is a tendency to group humans into consumer cohorts which often results in poor experiences for the users and eventually poor results for the business. In 1986, Don Norman, often referred to as the grand-old man of design, coined the term 'User Experience' because of the exponential rise of human-computer interaction (Anderson et al., 1988). In Design literature published during the 80's and 90's Norman and others shifted towards humanizing the design process and developed the human-centered design approach. This approach helps businesses design products, services, systems that reduce the cognitive load and are emotionally appealing (Giacomin, 2014). Once marketers start treating users and consumers as humans with real human needs and having jobs to be done (Christensen et al., 2016) the focus shifts towards creating 'experiences' for the consumers. Marketers have always been tuned to address a need based on market research data or based on what consumers are demanding. Designers tend to look at things from a more human perspective which focuses more on the experience (Brown, 2008).

Designers often face the challenge of designing an overall experience for users rather than merely designing a product, service, webpage, interface or an interaction. Their biggest challenge in the current digital age is to create an enriching experience through a device (Hassenzahl, 2011). Designers of online experiences are increasingly using Augmented Reality (AR) and Virtual Reality (VR) technologies to create a well-defined user experience and resolve the issue of physical intangibility during product evaluation (Mishra et al., 2020).

1.2 Understanding the user

To design the best possible experience, marketers have been trying to understand consumer behavior by collecting data relating to the experiences faced by the user at every interaction with the product, service, or the firm. The approach of understanding consumers is a well-established practice and is a core principle underlying Toyota's production system, which is referred to in Japanese as genchi gembutsu, which translates as "go and see for yourself" (Krijnen, 2007). This is one of the core principles of Lean manufacturing and encourages business decisions to be taken based on first-hand knowledge and is applied in Toyota not just in Production and manufacturing but also in Sales, Product development, distribution, or public affairs. (Liker, 2004).

The goal in getting first-hand knowledge from customers is not for clear cut answers on what jobs they want the product to perform, rather it is to understand what challenges and problems they face. This understanding can help in creating a customer archetype which puts a human face to the target user and helps in aligning the product development team towards the human they want to reach out to. This archetype is more a hypothesis, which needs to be validated in a manner suitable to the team (Ries, 2011). When users purchase a product, they are essentially hiring the product to do a job. If the product does not do a great job and results in a poor overall experience, then users either fire or replace the product with another product that can achieve the job (Christensen et al., 2016).

Studies show that experiential purchases (i.e., the acquisition of an event to live through, such as a concert, a dinner, a journey) make people happier than material purchases (i.e., the acquisition of tangible objects, such as clothing, jewellery, stereo equipment) of the same value (Boven and Gilovich 2003; Carter and Gilovich 2010).

Defining an Experience

Experience can be defined as a story, emerging from the dialogue of a person with her or his world through action and societies are shifting from the material to the experiential, which poses challenges to technology-oriented businesses (Hassenzahl, 2011). Studies show that experiential purchases (i.e., the acquisition of an event to live through, such as a concert, a dinner, a journey) make people happier than material purchases (i.e., the acquisition of tangible objects, such as apparel, jewelry, electronics) of the same value (van Boven and Gilovich, 2003).

A series of experiences tell a story that moves a person from one emotional state to another and marketers can place a brand within this story, that can be very powerful for the business. From a marketer's perspective the experiences faced by consumers can be orchestrated to build a strong brand and deliver business results (Gross and Cook, 2019).

1.3 Crafting experiences through Digital Reality

Digital reality is generally defined as the wide spectrum of technologies and capabilities like AR, VR, MR, 360° video, and the immersive experience, enabling simulation of reality in various ways (Cook, 2021).

To comprehend digital reality as it relates to crafting experiences, it is important to look at the four concepts that are generally considered under the umbrella term of digital reality. Virtual Reality (VR) refers to experiences enabled via a headset and users get to immerse themselves in artificial surroundings that portray actual places or imaginary worlds. Augmented Reality (AR) overlays contextual information on the actual physical environment users see, thus combining digital components and experiences with real life. Mixed Reality (MR) blends the user's real-world environment and digitally created content and uses advanced sensors for spatial awareness and gesture recognition. MR brings together the virtual and real worlds to generate new environments in which both digital and physical objects and their data can coexist and interact with one another. 360° video provides a new perspective that allows users to look in every direction. This is achieved by shooting with an omnidirectional camera or a collection of cameras (Deloitte Insights, 2017). A deeply engaging multisensory digital experience can be delivered using VR, AR, MR, and 360° video, among other technologies.

1.4 Growth of Multi-sensory experiences

Online shopping has been growing significantly over the past few years and the recent pandemic induced lockdowns have thrown up newer challenges for marketers. Key among them being the issue of online product evaluation, especially when users cannot physically touch or see a product. Technologies like AR/VR and mobile apps are being used increasingly in the hope that the challenge of mental and physical intangibility can be addressed. Recent research has examined consumer responses to such interfaces (Mishra et al., 2020).

A multi-sensory experience can be defined as impressions formed by specific events whose sensory elements have been crafted by someone (Velasco and Obrist, 2020). A key challenge designers face is that of creating an interesting, rich, and meaningful experience for users. They can be more successful at designing such experiences if they can understand the messages conveyed by different sensory channels and how they contribute to the overall experience of the user (Schifferstein, 2011). These experiences are intentionally created and hence the 'design' element is implied, so the terms 'multisensory design' and 'multisensory experience design' are used interchangeably.

Online sales have been increasing ever since the advent of the internet and by 2020, retail e-commerce sales worldwide amounted to 4.28 trillion US dollars and are projected to grow to 5.4 trillion US dollars

in 2022 (Statista). Online shopping presents a unique challenge to marketers because consumers cannot engage with the product physically and the interaction is limited to visual and auditory senses (Krishna, 2012).

Traditionally marketers have relied on the sense of sight and sound while advertising on electronic media. In the present digital world, with an increasing number of users adopting online shopping, there is a shift towards technologies like Augmented Reality (AR) and Virtual Reality (VR) to engage with users via multiple senses (Mishra et al., 2020). This study explores the various dimensions of sensory interactions and how other sensory interfaces like touch, AR and VR are increasingly being adopted by firms to increase user engagement and interaction.

Recent progress in the field of human–computer interaction led to online experiences engaging more of the human senses and becoming more connected with offline environments. This expansion will likely coincide with an increasing engagement with the consumer's more emotional senses, namely touch/haptics, and possibly even olfactory senses. Forward-thinking marketers and researchers will therefore need to appropriate the latest tools and technologies to deliver richer online experiences for tomorrow's consumers (Flavián et al., 2019).

Online experiences

Given the focus of this paper is primarily online experiences, it is important to understand what attracts consumers to the internet and what makes them stay engaged on a website. When consumers are deeply engaged in an online activity, they experience a sense of enjoyment, telepresence, a loss of self-consciousness and a merging of action and awareness (Chen et al., 2000). This experience is often found in various forms of play and referred to as ‘flow’ denoting the holistic sensation that is experienced when one acts with total involvement (Nakamura and Csikszentmihalyi 2014).

The online flow experience can be looked at from the perspective of experiential and goal-directed activities. The conceptual model of flow (Hoffman et al., 1996) provides insights into the navigation process of web users and the key theme of this model is the concept of flow, which is the complete immersion and engagement in an activity. The model provides insights into the elements that create a compelling online experience, the nature of a flow experience and the outcomes from the experience.

(Novak and Hoffman, 1999). In a marketing context, the flow experienced by users on a website is key to explaining their cognitive, attitudinal and behavioral responses (Noort et al., 2012).

1.5 Business value of experience design

There is growing evidence pointing to the value of experience design and how it helps improve the financial metrics of firms. There is a strong correlation between design and financial performance measures like sales, profits, turnover, and growth (Value of Design Factfinder report, 2007).

The Design Value Index Study shows 10-year returns yielding 2.11 times (211%) that of the S&P 500 (Design Value Index, 2015). Companies considered for the DVI Portfolio are Apple, Coca-Cola, Ford, Herman-Miller, IBM, Intuit, Nike, Procter & Gamble, SAP, Starbucks, Starwood, Stanley Black & Decker, Steelcase, Target, Walt Disney, and Whirlpool.

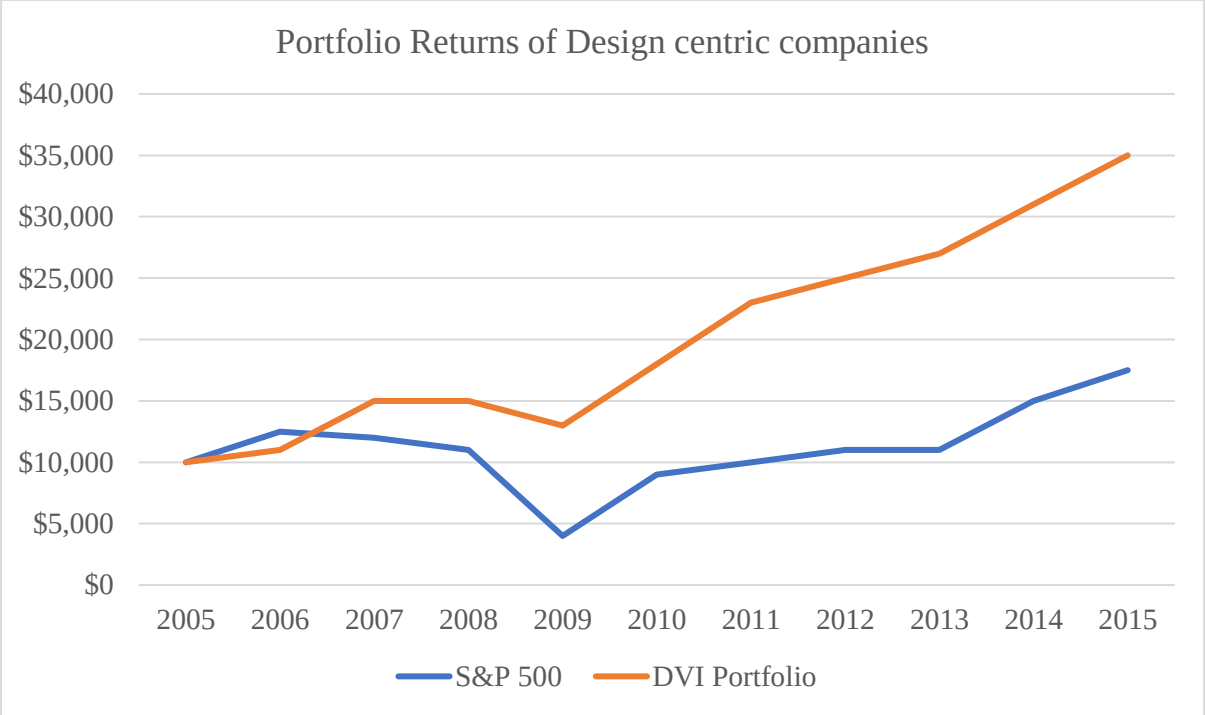

Figure 1: Design Value Index
(Source: Adapted from https://www.dmi.org/page/2015DVIandOTW/2015-dmiDesign-Value-Index-Results-and-Commentary.htm)

1.6 Changing trends across Generations

An often-used parameter to observe consumer behavior is that of changing trends and preferences across generations. This helps understand shifts in consumer attitudes and thinking over time and holds special significance in the Digital era to analyze the effects of technology on various generations. Commonly used definitions of the various living generations of humans are provided below.

Classification of various Generations

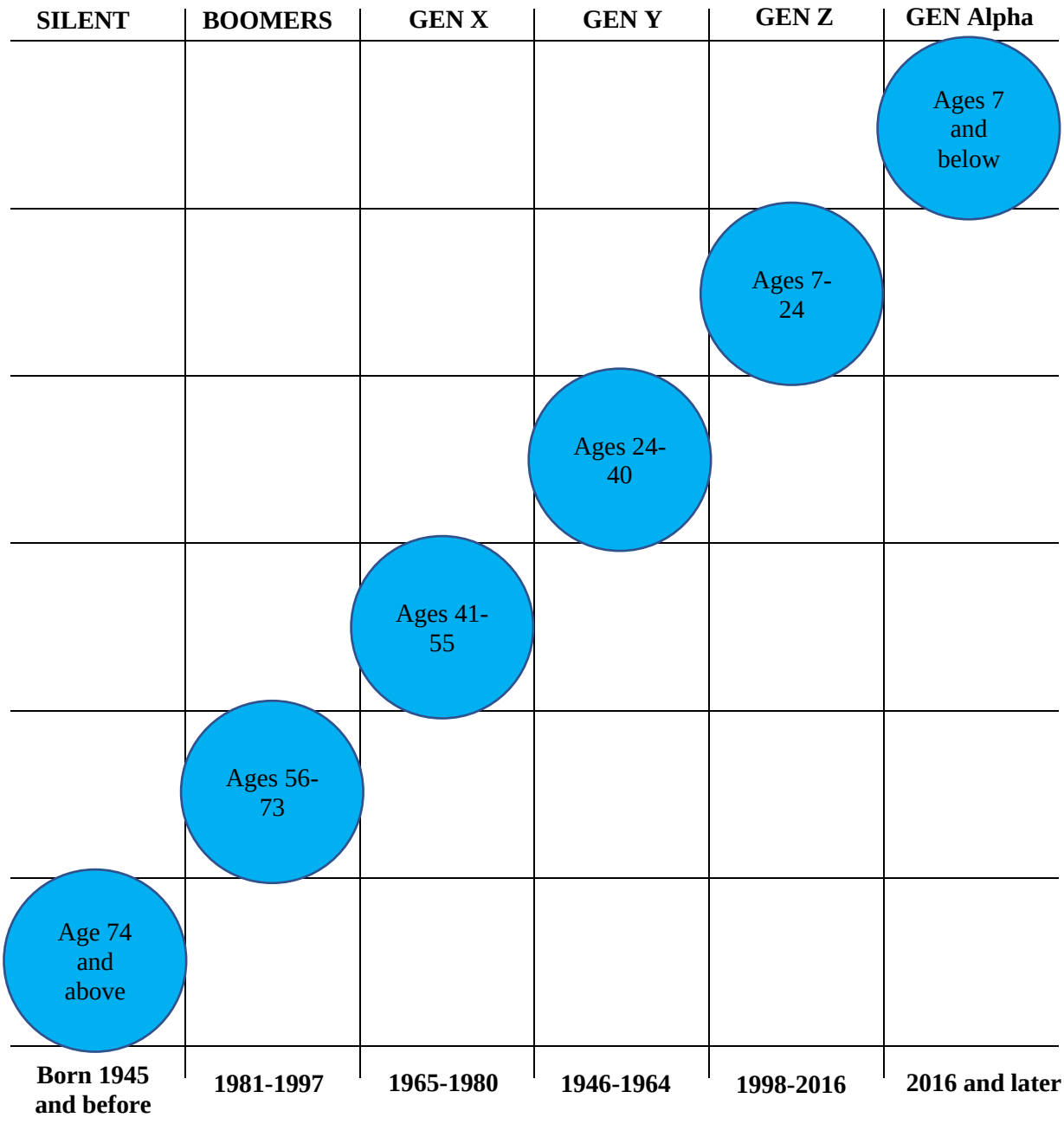

Figure 2: Classification of various Generations
(Source: Adapted from Kearney Consumers@250 study (https://www.kearney.com/web/consumers-250/article/?/a/america-s-next-commercial-revolution-influence-vs.-affluence)

Of particular interest to this paper is how digital technology has influenced various generations especially the Millennials and Gen Zs. Generations of people who have been influenced by digital technologies like the internet, social media and google are often referred to as Digital Natives (Helsper, 2009; Prensky, 2001). These are called so primarily because they are native speakers of the digital

language of computers, video games and the internet. Those people who were not born in the digital era but have adopted digital technology later, come to be referred as Digital Immigrants (Prensky, 2001). Consumers across generations are eager for personalized products and are willing to pay a premium for products that highlight their individuality. Technology has given young people an unprecedented degree of connectivity among themselves and with the rest of the population. That makes generational shifts more important and speeds up technological trends as well. For marketers, this shift will bring both challenges and equally attractive opportunities (Francis and Hoefel, 2018).

SECTION 2

Literature Review

2.1 Literature map

Research done in this area is concentrated on the importance of design, technology and how different generations have adopted this area. Significant research has also been published on how consumer behavior changes based on the experience offered by a product, the technology adopted to offer this experience and the age group of the consumers. The figure below is an outline of the 4 broad areas of literature reviewed.

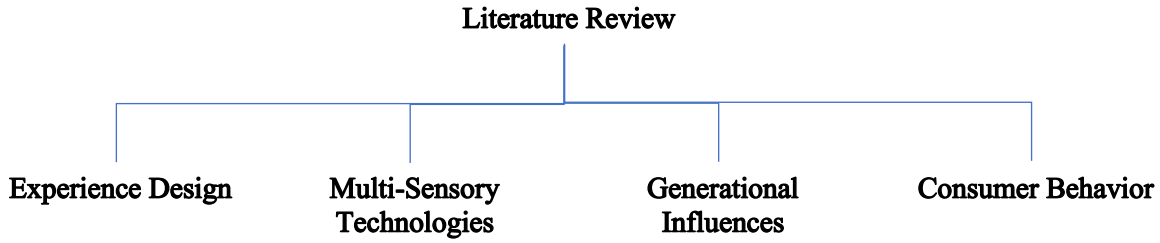

Figure 3: Literature review framework

2.2 Conceptual Coverage of Literature

There is a large volume of literature in the context of consumer psychology, product design and the role of technology. However, there is limited research in the context of how different generations of consumers perceive experience design as a key factor influencing their online purchase behavior. Research has indicated that this area is worth studying since this understanding will help marketers plan and design strategies that are inclusive and work across generations of consumers.

2.3 Classification of literature review

Previous research studies reviewed for this paper can be broadly classified into 4 areas:

- Experience design
- Multi-sensory Technology
- Consumer Behavior
- Generational influences

2.4 Summary table of literature review

Table 1: Summary table of literature review

Author	Year	Title	Type of Literature	Experience Design	Multi-sensory Tech	Generational influences	Consumer Behavior
Blythe M	2004	Interview with Don Norman	Journal Article	✓			
Bollard, A.	2017	Where stores can still compete- and win	Journal Article		✓		
Bowers, Micah	2019	The Ultimate Experience: A Guide to the Principles of Sensory Design	Webpage	✓			
Brown, Tim	2008	Design Thinking	Journal Article				✓
Carlgren, Lisa	2016	Design Thinking in innovation, in practice: the case of Kaiser Permanente	Journal Article	✓			
Carmigniani, Julie	2011	Augmented Reality: An Overview	Book section		✓		
Chitturi, Ravindra	2008	Delight by design: The role of hedonic versus utilitarian benefits	Journal Article	✓			✓
Choi, Yung Kyun	2014	How do 3-dimensional images promote products on the Internet?	Journal Article		✓		
Christensen, Clayton M	2016	Know Your Customers' "Jobs to Be Done" Is innovation inherently a hit-or-miss endeavor? Not if you understand why customers make the choices they do	Report	✓			
Cook, Allan	2020	https://www2.deloitte.com/us/en/insights/topics/emerging-technologies/augmented-shopping-3d-technology-retail.html	Webpage		✓		
Cook, Allan	2018	https://www2.deloitte.com/content/dam/insights/us/articles/4426_Digital-reality-primer/DI_Digital%20Reality_Primer.pdf			✓		
Cook, Allan	2019	https://www2.deloitte.com/us/en/insights/topics/emerging-technologies/digital-reality-storytelling-brand-marketing.html	Webpage		✓		

Darrell K. Rigby, Mikey Vu, and Asit Goel	2019	4 Questions Retailers Need to Ask About Augmented Reality	Magazine article		✓		
Das, Kaushik	2016	Unlocking Indonesia's Digital Opportunity			✓		
Denstitt, Kristina	2016	VR Shopping: Retail's New Reality	Webpage		✓		
Design Council	2007	The Value of Design Factfinder report	Report	✓			
Dinas, Elias	2014	Age-Period-Cohort analysis: A design-based approach	Journal Article			✓	✓
Douglas, Matthew A.	2016	Art of the possible or fool's errand? Diffusion of large-scale management innovation		✓			
Eyal, N., and Hoover, R.	2014	Hooked: How to build habit-forming products.	Book section	✓			✓
Fertik, M	2020	Why is Influencer Marketing such a big deal right now?					✓
Forrester	2021	https://www.forrester.com/press-newsroom/forresters-european-banking-cx-index-2021-pandemic-boosted-the-importance-of-delivering-strong-digital-experiences/	Webpage			✓	
Francis, Tracy	2018	Generation Z characteristics and its implications for companies | McKinsey	Webpage			✓	✓
Guda van Noort, Hilde A.M. Voorveld & Eva A. van Reijmersdal	2012	Interactivity in Brand Web Sites: Cognitive, Affective, and Behavioral Responses Explained by Consumers' Online Flow Experience	Journal Article	✓			
Han, Dai In	2018	User experience model for augmented reality applications in urban heritage tourism	Journal Article	✓	✓		
Hassenzahl, Marc	2004	The interplay of beauty, goodness, and usability in interactive products	Journal Article	✓			
Hassenzahl, Marc	2006	User experience - A research agenda	Journal Article	✓			
Hassenzahl, Marc	2013	Designing moments of meaning and pleasure. Experience design and happiness	Journal Article	✓			
Hassenzahl, Marc	2001	The effect of perceived hedonic quality on product appealingness	Journal Article	✓			
Hassenzahl, Marc	2010	User Experience and Experience Design Fundamentals of user experience View project The Mill Sessions View project	Report	✓			
Helsper, Ellen Johanna	2010	Digital natives: Where is the evidence?	Journal Article			✓	✓
Hoffman, D. L., & Novak, T. P.	2009	Flow online: lessons learned and future prospects.	Journal Article				✓
Krishna, Aradhna	2013	Customer sense: How the 5 senses influence buying behavior	Book section	✓			✓

Krishna, Aradhna	2012	An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior	Journal Article	✓			✓
Krishna, Aradhna	2019	Aradhna Krishna Note on Sensory Marketing: Shaping Consumer Perception and Behavior	Report		✓		
Kumar, S Ramesh	2015	Sensory Branding: Oreo in the Indian context	Report	✓			
Loeb, Walter	2019	https://www.forbes.com/sites/walterloeb/2019/09/23/digital-first-consumers--a-new-way-retailers-must-think-about-customers/?sh=2241d249337f	Webpage				✓
Lusch, Robert F. and Vargo, Stephen L.	2006	The Service-Dominant Logic of Marketing	Book section				✓
Mandel, T	2002	User/System Interface Design. Encyclopedia of Information Systems	Book section	✓			
Mishra, Anubhav	2021	From "touch" to a "multisensory" experience: The impact of technology interface and product type on consumer responses	Journal Article	✓	✓		
NNgroup	2016	Don Norman: Emotional Design	Book section	✓			
Nakamura, Jeanne and Csikszentmihaly, Mihaly	2014	The concept of flow. In Flow and the foundations of positive psychology	Book section		✓		
Norman, Don	2016	The Design of Everyday Things	Book section	✓			
Norman, Don	2018	Why bad technology dominates our lives	Webpage	✓			
Novak, T. P., Hoffman, D. L., & Yung, Y. F.	2000	Measuring the Customer Experience in Online Environments: A Structural Modeling Approach*	Journal Article				✓
Orús, Carlos	2021	Enhancing the customer experience with virtual and augmented reality: The impact of content and device type	Journal Article		✓		
Petit, Olivia	2019	Digital Sensory Marketing: Integrating New Technologies Into Multisensory Online Experience	Journal Article	✓	✓		
PR Newswire	2021	https://www.prnewswire.com/news-releases/future-of-global-digital-reality-market-forecast-to-2021---vr-application-in-the-manufacturing-sector-is-projected-to-increase-by-98-9-between-2017-and-2021--300716802.html	Webpage		✓		
Prahalad C. K.	2004	The Future of Competition	Book				✓
Prensky, Marc	2001	Digital Natives, Digital Immigrants	Report			✓	
Roggeveen, Anne L.	2015	The impact of dynamic presentation format on consumer preferences for hedonic products and services	Journal Article				✓
Rotar, A	2020	ECommerce Report 2020. Statista Digital Market Outlook, 138.	Report				✓

Schifferstein, Hendrik N.J.	2011	Multi sensory design	Conference proceedings		✓		
Schmitt, Bernd	2011	Experience Marketing: Concepts, Frameworks and Consumer Insights	Journal Article				✓
Scholz, Joachim	2016	Augmented reality: Designing immersive experiences that maximize consumer engagement	Journal Article		✓		
Shin, Dong Hee	2011	Consumers' trust in virtual mall shopping: The role of social presence and perceived security	Journal Article		✓		
Shneiderman, B Plaisant, C., Cohen, M. S., Jacobs, S., Elmqvist, N., & Diakopoulos, N.	2016	Designing the user interface: Strategies for effective human-computer interaction.	Book	✓			
Simms, Kane	2019	How Voice Assistants Could Change the Way We Shop	Report		✓		
Spool, Jared M	2005	What Makes a Design Seem 'Intuitive'?	Journal Article	✓			✓
Tsai, Shu Pei	2005	Integrated marketing as management of holistic consumer experience	Journal Article	✓			
UNCTAD	2019	https://unctad.org/news/global-e-commerce-jumps-267-trillion-covid-19-boosts-online-sales	Webpage				✓
Velasco, Carlos	2021	Multisensory Experiences: A Primer	Journal Article	✓	✓		
Velasco, Carlos	2021	Multisensory consumer-computer interaction	Journal Article		✓		✓

2.5 Research Gap

In 2020 retail ecommerce sales amounted to USD4.28 trillion and is expected to grow by 50% in the year 2024 (Statista, 2021). Most of these online purchases either happen via a computer interface or a mobile device. It is estimated that by 2025 more than 10% of all retail sales in the US would be generated via mobile commerce (Statista, 2021). Given this significant contribution of mobile devices towards online sales, it is important to study the factors that affect consumers in the buying process.

A review of the literature has revealed that there is limited research on the impact of immersive technology on consumer behavior in an online setting. The research is further limited by the fact that immersive technologies are yet to make their presence felt in a big way. It is highly likely that consumers want to try out new technology due to the novelty factor, however mere usage of new technology does not translate into sales.

Another factor at play is the adoption of immersive technology by groups of consumers, and here again the research is nascent. A simple way to group consumers is based on age and address the questions on how the elderly population takes to using new technologies like smartphones and AR/VR devices vis-à-vis a younger and more digitally savvy generation (Mishra et al 2018).

A simplistic view does not consider the factors related to digital adoption and savviness. This research will be conducted across various groups to understand the factors that are impacting their online shopping behavior. Some of the factors to be considered are listed below:

- Intuitiveness of the experience offered by a new technology
- Serving a utilitarian or a hedonic need
- Adherence to well established design practices like Heuristics and Gestalt's design principles
- Context specific experiences (as in the case of tourism, furniture, food etc)
- Type of interface and time taken to complete an online purchase
- Novelty effect of new technologies

SECTION 3

3.1 Need for the study

Global eCommerce sales have jumped to USD26.7 trillion in 2019 and expected to grow further in the coming years, both in B2B and B2C segments (UNCTAD, 2019). The pandemic induced restrictions have further increased the rise in eCommerce transactions, and online retail sales have reached 19% of total retail sales. The B2B and B2C sales have contributed to 30% of global GDP in 2019. This growth is driven largely by the ubiquitous nature of smartphones, easy internet access and the convenience of making purchases without having to go to a store. This trend increased the need for more research on how humans interact with various websites.

3.2 Research questions

This study aims to answer questions that are often raised by marketers in relation to consumer experience of online shopping, translating to actual sales of products and services. It focuses on how multi-sensory experience design can influence consumer's experience on a website and translate that experience into something more meaningful and pleasurable. The study aims to address the below questions:

1. Does greater product variety lead to confusion for the consumers in the form of choice of plenty, thereby driving consumers to seek multi-sensory design to make a purchase decision?
2. Do consumers require multi-sensory technology based on complexity of the product?
3. Do different generations of consumers respond differently to newer technologies like AR/VR?
4. Does a multi-sensory experience lead to lower cognitive load for consumers?
5. Does multi-sensory design lead to improved user experience?
6. If a product provides an immersive experience, does it lead to higher perceived value?

SECTION 4

4.1 Research Objectives

- To identify factors that enable consumers adopt multi-sensory interfaces, devices and technology.
- To select those factors that hold importance for different generations of consumers.
- Develop a framework that can help marketers take decisions on technology investment.
- Develop managerial implications of multi-sensory experiences for different sets of consumers.

4.2 Conceptual framework and Hypotheses

The infographic below represents the conceptual framework of this paper. Adoption and success of multisensory experience design is broadly dependent on two stakeholders involved. First and most important are the consumers who are trying to get a 'job' done by using AR/VR/Touch devices. Second are the firms or organizations that want to realize business value by leveraging these multisensory devices. Understanding why customers make the choices they do and knowing the customers 'Jobs to be done' is a key element in gaining user insights (Christensen et al., 2016)

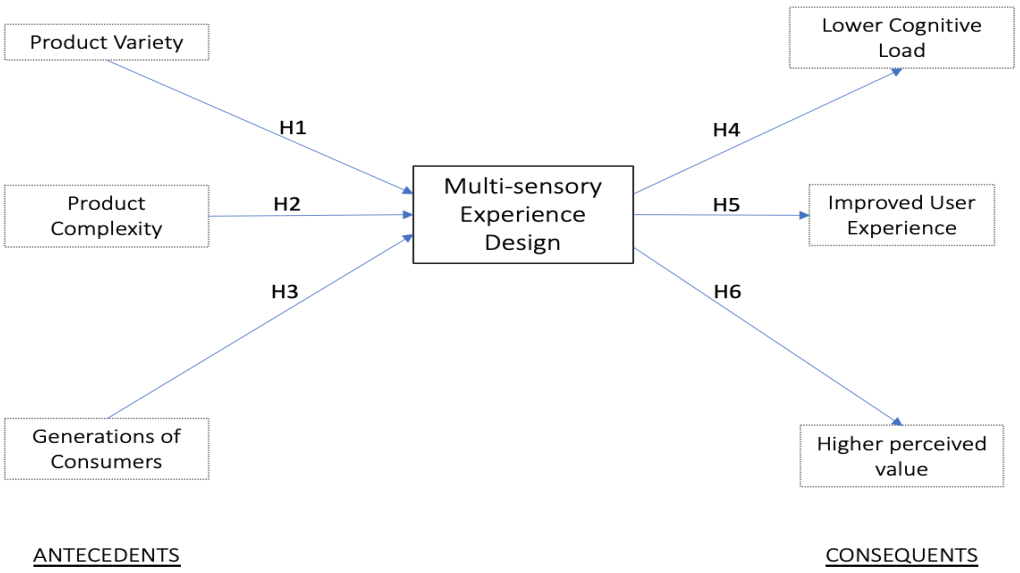

Figure 4: Conceptual framework

4.3 Background for hypotheses formulation

Consumers in the twenty first century have more choices that yield less satisfaction. They have wide access to information on companies, products, services, consumer actions and reactions from all over the world (Prahalad C. K. and Ramaswamy V, 2001). This access only amplifies further with the advent of social media and greater access to internet. Digital consumers need a different marketing approach, and the traditional company or product centric approach no longer works (Petit et al., 2019). Digital consumers prefer immersive buying experiences as against a transactional process-oriented approach. Therefore, we propose the following alternate hypotheses.

4.3.1 Product variety

In an online market, consumers have a large variety of product options to choose from. This large variety increases the cognitive load on consumers and leads us to assume that consumers require an easy way to make an online purchase. The role of multi-sensory experience design is to reduce the perceived complexity of the product variety.

Hypothesis H1: Greater the product variety, greater is the need for multi-sensory experience design.

4.3.2 Product complexity

Products that are complex in nature require greater involvement from consumers in terms of the time required for decision-making and the amount of information to be processed. This leads us to believe

that complex products put a higher cognitive load on the consumers, and this leads us to our next hypothesis.

Hypothesis H2: As the complexity of a product increases, the need for multi-sensory experience design also increases.

4.3.3 Generations of Consumers

Gen X and Millennial consumers have adopted digital technologies during the late 90's and early 2000's. This generation is also the one with a significant amount of disposable income, however they may not be able to accept new technology so easily. Asking them to wear a VR headset to experience a tourism destination, may not exactly amount to ease of use for them. On the basis of the above we propose our next hypothesis.

Hypothesis H3: The younger generation of consumers have a higher propensity to adopt multi-sensory experience design.

4.3.4 Lower cognitive load

Web design and usability guidelines suggest reducing the cognitive workload of the users (Shneiderman et al., 2016). In an online marketing context this translates to making the process easy for consumers to search, compare and make purchase decisions. This is done by reducing the users' memory load and an understanding of user behavior and cognition (Mandel, 2002). This leads us to our next hypothesis.

Hypothesis H4: Multi-sensory experience design lowers the consumers' cognitive load.

4.3.5 Improved user experience

User experience is the deliberate design of experiences with technology (Hassenzahl, 2013). When consumers receive a pleasant user experience, they are likely to be in a state of flow and remain engaged with the website. We assume that the adoption of new multi-sensory technology can improve the user experience, and thus leads us to the next hypothesis.

Hypothesis H5: Multi-sensory experience design leads to better user experience.

4.3.6 Higher perceived value

The overall value offered by a product is based on functional, financial, social and psychological value offered by the product (Doyle, 2009). We assume that by adopting multi-sensory experience design all

the four factors can be understood by the consumer and thus enabling them in making the right choices. This leads us to our next hypotheses.

Hypothesis H6: Multi-sensory experience design leads to higher perceived value.

SECTION 5

Research Methodology

5.1 Research design

For the proposed research, descriptive research design using online survey questionnaire is proposed to be adopted, with the intention of eliciting accurate and representation of persons, events and situations (Saunders, 2019) relying on online questionnaire format.

5.2 Scope of the study

Consumers who use digital technology for making online purchases have been chosen because this segment has grown significantly in the last few years and is expected to grow further. The sample for research is very large since it includes all consumers who are users and potential users of Digital technology. The sample will comprise of consumers who currently use high-end smartphones, since these are the ones most likely to adopt new multi-sensory technology like AR/VR. To minimize bias, both purposive and judgement sampling will be used.

5.3 Sample design

The population of target consumers here is everyone who has access to a smartphone and does online shopping. The population size being more than 50,000, we apply formula of Godden (2004) for sample size calculation.

Sample size = $\frac{[Z^2 p\ (1-p)]}{C^2}$

Z = Z-score (considering confidence level of 90%, this value is 1.645)

p = Maximum proportion of the population of interest. Considered as 0.5 for this case.

C = margin of error (considering 5% in this case)

Based on the above, the sample size comes to: $[1.645^2 * 0.5\ (1\text{-}0.5)]/0.05^2 = 270.6$

This gives us a sample size of 271 respondents to be surveyed.

5.4 Source of data collection

5.4.1 Primary data collection:

Primary data will be collected via online questionnaire method. The questionnaire design will be based on below categories:

- Identification of consumers
- Category of smart phones used
- Comfort level with online transactions (financial and non-financial)
- Qualitative inputs on online shopping experiences
- Comfort level using multisensory technologies

5.4.2 Secondary data collection:

Given the broad nature of consumer psychology and the fact that technology is constantly evolving, and consumer preferences are changing very often, secondary data is critical for the study to understand trends, technology advances and consumer preferences. These will be collected via:

- Journals
- Research reports
- Forrester, Gartner and similar research organizations
- Reports published by McKinsey, Deloitte and similar management consultants

5.5 Statistical tools for analyzing the data

Since this research deals primarily with measured and latent variables and involves hypotheses across these variables, Structural Equation Modeling (SEM) will be used as a tool to test the hypotheses and analyze data. SEM has the ability to represent unobserved concepts and constructs that are lacking in the previous literture. It also helps in depicting complex relationships among the variables in a visual manner.

SECTION 6

Chapterization

The proposed study will contain the following chapters:

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Conceptual Framework and Hypotheses formulation

Chapter 4: Research design and methodology

Chapter 5: Data collection and analysis

Chapter 6: Results and interpretations

Chapter 7: Conclusion and Managerial implications

Bibliography and References

Appendix

SECTION 7

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